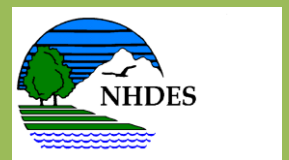


February
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Guidance to Refine the Potable Water Definition in New Hampshire Municipal Building Codes



Developed through a collaborative effort of the New Hampshire Building Officials Association, NH Health Officers Association, NH Planners Association, and NH Department of Environmental Services.

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New Hampshire
Department of Environmental Services

**Guidance to Refine the
Potable Water Definition in
New Hampshire Municipal Building Codes**

Prepared by
Drinking Water and Groundwater Bureau

February 2015

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Purpose and Introduction

This document provides guidance to municipalities that wish to incorporate a refined definition of “potable water” into their building codes. It is a response to inquiries from municipal officials who want to better protect the health of residents who use private wells. This document was developed by the New Hampshire Building Officials Association, New Hampshire Health Officers Association, New Hampshire Planners Association and New Hampshire Department of Environmental Services.

New Hampshire State Building Code requires that every structure equipped with plumbing fixtures and used for human occupancy be provided with a *potable water supply*. The Building Code defines potable water as “*water free from impurities in amounts sufficient to cause disease and harmful physiological effects.*” Interpreting and administering this definition has been difficult for local officials as it does not clearly state which impurities should be considered, nor the amounts in drinking water that cause human health impacts.

To assist local officials responsible for administering this portion of the building code, this document suggests a minimum list of contaminants and corresponding contaminant limits that can be used to refine the potable water definition. When incorporated into a local building code along with a requirement for water testing, *the refined definition of potable water will in some cases require treatment in order to achieve compliance* necessary for local approvals, such as issuance of an occupancy permit.

Beyond the minimum list of contaminants suggested in this document, a number of other contaminants that could cause disease and harmful health effects are often present in well water in New Hampshire. Therefore, *local conditions may warrant water testing and treatment for additional contaminants not on the minimum list*. Language presented in this document provides for municipalities to add contaminants to the minimum list.

Section 1: The Need for Testing of Private Wells

Nearly half of New Hampshire's residents rely on private wells as their primary source of drinking water at home.¹ When building or buying a home served by a private well, homeowners often assume that the water supply is free of contaminants and safe to drink. However, the occurrence of contaminants at harmful levels in well water in New Hampshire is quite common, and many of those contaminants are colorless and have no detectable taste or odor. Unlike public water systems that must regularly test drinking water for up to 90 contaminants and meet stringent water quality standards under the Federal and State Safe Drinking Water Acts, *private wells in New Hampshire have no state or federal requirements to test for or remove contaminants, even when present at unhealthy levels.*

Under state and federal regulations for public water systems, over 90 drinking water contaminants are regulated in order to protect public health or address "aesthetic" (e.g., odor or taste) problems. There are no similar state or federal regulations for private wells.

Human exposure to some contaminants, such as certain strains of *E.coli* bacteria or high levels of nitrate, can result in immediate illness, such as gastroenteritis. Other contaminants, such as arsenic and radon, when consumed in drinking water over a long period of time, increase the risks for developing certain forms of cancer, cardiovascular diseases and neurological disorders.

For example, studies have found a correlation between private well use in New England and deaths due to bladder cancer,² and have estimated that hundreds of cases of cancer over the lifetimes of the current population in New Hampshire may be preventable by testing for and treatment of arsenic in private well water.³ Children whose primary source of drinking water is a private well may be at particular risk. In 2009 the American Academy of Pediatrics (AAP) released a policy statement outlining health risks to children posed by contaminants found in groundwater.⁴ The AAP policy recommends that pediatricians ask parents whether they have recently tested their well water and that states adopt laws to require testing of well water during real estate transfers. Ensuring that all residents have access to safe drinking water is an important public health goal.

Approximately 20 percent of private wells in New Hampshire have unhealthy levels of arsenic in drinking water. Arsenic exposure above the drinking water standard is a known risk factor for bladder cancer, as well as a variety of other serious chronic diseases.

¹ NHDES's most recent estimate is 46% of N.H. residents in 2010.

² J.D. Ayotte, D. Baris, K.P. Cantor, J. Colt, G.P. Robinson, J.H. Lubin, M. R. Karagas, R.N. Hoover, J. F. Fraumeni, and D.T. Silverman (2006). *Bladder cancer mortality and private well use in New England: an ecological study. J Epidemiol Community Health*, 60:168–172

³ M. Borsuk, L. Rardin, M. Paul, and T. Hampton (2014). *Arsenic in Private Wells in NH*. Thayer School of Engineering at Dartmouth

⁴ American Academy of Pediatrics, Committee on Environmental Health and Committee on Infectious Diseases (2009). "Drinking Water From Private Wells and Risks to Children," *Pediatrics* 123 (2009): 1599-1605. <http://pediatrics.aappublications.org/cgi/content/full/123/6/1599>

Certain contaminants found in New Hampshire's groundwater occur naturally due to geologic or soil conditions, while others are associated with human activities. For example, New Hampshire was once known as the "Arsenic State," with more than 300 operating arsenic mines during the 19th century.⁵ Arsenic is common in the bedrock aquifers that supply many of the state's wells. In New Hampshire nearly all new private wells are drilled into bedrock formations and studies indicate that one in five bedrock wells fails the state and federal health-based standard for arsenic; the number is much higher in some areas and lower in others.⁶

While arsenic and other contaminants occur naturally in groundwater, human sources of contamination such as leaking underground fuel tanks, chemical spills, closed landfills, road salt and other land uses may also present health risks for private well users. Volatile organic compounds (VOCs) used in fuels and a variety of commercial products including industrial cleaners and solvents sometimes find their way into groundwater. In a 2005 study by the U.S. Geological Survey, the gasoline additive methyl tertiary butyl ether (MtBE) was detected in 21 percent of private wells sampled and in 40 percent of public water systems sampled across the state, even in wells located in remote areas.⁷ MtBE, which is no longer being added to gasoline in New Hampshire but continues to be found in our well water, has been determined by U.S. EPA to cause cancer when consumed in drinking water at levels above the health-based standard over a prolonged period of time.

Section 2: Municipal and State Authority Involving Potable Water in Private Wells

Municipalities currently have the authority to determine what constitutes potable water as it relates to the Building Code. The State Building Code under RSA 155-A establishes minimum building standards that apply within all municipalities in New Hampshire. The State Building Code adopts by reference the International Plumbing Code (IPC), which requires a potable water supply "*for every structure with plumbing fixtures and utilized for human occupancy...*" per Section 602.1.

"Only potable water shall be supplied to plumbing fixtures that provide water for drinking, bathing or culinary purposes..."

Section 602.02 Potable Water Required. International Plumbing Code (2009)

The IPC's definition of potable water requires drinking water to be "*free from impurities present in amounts sufficient to cause disease...and conforming to the bacteriological and*

⁵ Carter, S. Laura, (undated), Arsenic in odd places: Researchers look into toxic metal mysteries. Dartmouth Medical School, Dartmouth Medicine: The Magazine of the Geisel School of Medicine at Dartmouth, http://dartmed.dartmouth.edu/winter00/html/vs_arsenic.shtml

⁶ J. D. Ayotte, M. Cahillane, L. Hayes, and K.W. Robinson (2012), Estimated Probability of Arsenic in Groundwater from Bedrock Aquifers in New Hampshire, 2011, USGS SIR 2012-5156.

⁷ J. D. Ayotte, B. R. Mrazik, D. M. Argue, and F. J. McGarry, Occurrence of Methyl tert-Butyl Ether (MTBE) in Public and Private Wells, Rockingham County, New Hampshire, USGS (2004)

chemical quality requirements of the Public Health Service Drinking Water Standards or the regulations of the public health authority having jurisdiction.” However, the IPC definition does not refer to specific contaminants, current drinking water quality standards, or the specific authority that should be responsible for ensuring that those standards are met. In New Hampshire, as in most states, drinking water quality standards apply only to public water systems, which must provide drinking water containing less than the *Maximum Contaminant Levels (MCLs)* for regulated contaminants.⁸ The N.H. Department of Environmental Services (NHDES) has the authority to enforce these standards to ensure public water systems provide safe water. Similar water quality standards could be applied under the IPC to private well water under local codes.

Under RSA 674:51 (Building Codes), municipalities are authorized to adopt local code requirements, provided they are at least as stringent as the State Building Code. This could be used to ensure that wells serving structures subject to the local plumbing code supply water that meets certain standards. This guide is meant to assist municipalities choosing this option. *Another option used by some municipalities is to require well testing under local health ordinances. NHDES can refer communities interested in this approach to these municipalities.*

The N.H. Water Well Board has adopted rules that establish minimum standards for well construction, siting and installation by licensed well drillers. A number of other state programs aim to prevent contamination of wells by establishing setbacks or regulating discharges to groundwater, including those that address septic systems, underground storage tanks, landfills, pesticide use, and stormwater discharges to groundwater. As stated earlier, none of these programs require well water quality testing or treatment.

Table 1 Recommended Testing for Private Wells

NHDES recommends having the following tests done every 3 to 5 years, except for bacteria and nitrate, which are recommended annually.

Standard Analysis

Arsenic	Lead
Bacteria	Manganese
Chloride	Nitrate/Nitrite
Copper	pH
Fluoride	Sodium
Hardness	Uranium*
Iron	

Radiological Analysis

Analytical Gross Alpha
Radon
Uranium*

Volatile Organic Compounds (VOCs)

*Please note: Uranium is part of both the standard and radiological analysis groups for the State of NH Lab.

⁸ Maximum Contaminant Levels (MCLs) are numeric water quality standards for contaminants regulated under the federal and NH Safe Drinking Water Act(s). See NHDES rules Env-Dw 702 through Env-706.

Water Quality Testing for Private Wells

NHDES *recommends* that all private wells users test their well water for the parameters listed in Table 1.⁹ Testing for these parameters provide a reasonable, cost-effective overview of a well's water quality, taking into account the cost of testing, likelihood of occurrence, health risks, and aesthetics (taste, odor, staining). In addition to including common health-related contaminants, the Standard Analysis group includes parameters such as pH and hardness that might not affect health or aesthetics by themselves, but do affect the selection of appropriate treatment technologies and add very little to the cost of testing. The results of the recommended tests, together with guidance provided by NHDES fact sheets and followed by consultation with water treatment professionals, enable homeowners or builders to make informed decisions regarding treatment or other means of limiting exposure to contaminants in well water.

In terms of an absolute *minimum* list of health-related contaminants that should be tested to determine potability, *the list in Table 2 is limited to contaminants with enforceable health-based standards that apply to public water systems*, while balancing cost and the likelihood of occurrence at unsafe levels in New Hampshire well water. All of the contaminants in Table 2 are known to negatively affect human health. There are many more contaminants regulated at public water systems, with more being added routinely.

Beyond the minimum list in Table 2, *testing for other contaminants could be required by the local building code based on local groundwater conditions or general public health concerns*. For instance, most new private wells in New Hampshire are drilled into bedrock and will likely exceed the NHDES Recommended Action Level for radon (2,000 picocuries per liter), at which point a test for radon in air is recommended. Consequently, a Radiological Analysis may be warranted for bedrock wells in most places across the state. (Note: Radon gas is carcinogenic and well water is one of the pathways for radon to be present at unhealthy levels in indoor air. However, radon has not been included in Table 2 because there is no enforceable standard for radon that currently applies to public water systems.) Local officials might also want to include iron and manganese, since it is common for these contaminants to impair both the drinkability of water (due to taste)

Table 2
Minimum List of Contaminants Included in the Refined Definition of Potable Water and Applicable Drinking Water Quality Standards¹⁰

Contaminants	Standards
Arsenic	<= 0.01 mg/L
Bacteria	Absent
Copper	<= 1.3 mg/L
Fluoride	<= 4.0 mg/L
Lead	<= 0.015 mg/L
Nitrate (NO ₃ -N)	<= 10 mg/L
Nitrite (NO ₂ -N)	<= 1 mg/L
Uranium	<= 0.030 mg/L

⁹ See the NHDES private well testing flier in Attachment 2.

¹⁰ The minimum list of contaminants in Table 2 is a small subset of the contaminants for which public water systems are required to meet standards. Local programs should make information available about the health risks associated with potential groundwater contaminants. Fact sheets on each of these contaminants are available from NHDES at (603) 271-2513 and can be accessed at www.des.nh.gov (A to Z List, Fact Sheets).

and the usability of water for laundering, and their tendency to cause staining of plumbing fixtures. There are also concerns about the potential impact of high levels of manganese on cognitive development in children. However, there is no enforceable standard for iron or manganese that currently applies to public water systems. Sodium might also be considered for inclusion due to its health implications for people on sodium-restricted diets. Volatile Organic Compound (VOC) testing, although relatively expensive, may also be indicated for inclusion in more developed areas, given the prevalence of MtBE throughout the state due to releases of gasoline containing MtBE.

When weighing the need for testing for contaminants not included in the minimum list in Table 2, consider the following factors:

- Contaminants found in nearby wells.
- Presence of nearby known contamination sites (e.g., leaks from underground storage tanks).
- Location of past or present nearby land uses involving fuel storage, hazardous chemicals, solvents, de-greasers, pesticides, and fertilizers.
- Nearby groundwater or stormwater discharges from commercial land uses, including those with septic systems.

Information about local groundwater conditions may be available from NHDES. Contact (603) 271-0688 for guidance on finding information related to local groundwater conditions.



Section 3: Adopting and Administering a Potable Water Standard

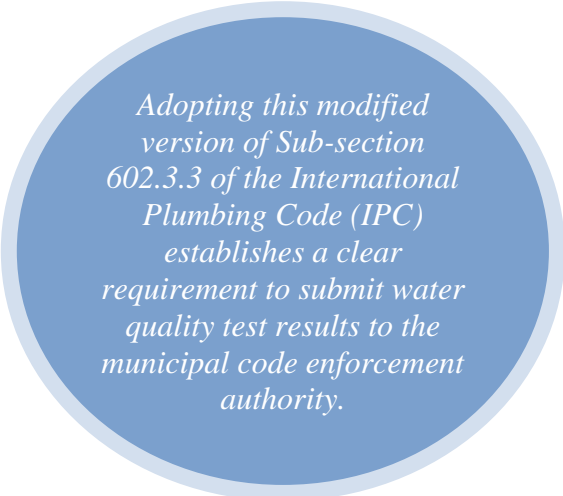
Defining Potable Water in a Local Building Code

Municipalities often adopt local building codes using the State Building Code as a template with or without local modifications. Changes to a local building code require a noticed public hearing and approval by a vote by the “local legislative body” (e.g., town meeting, town or city council) per RSA 674:51,I. As noted above, municipalities that wish to adopt local water testing requirements and water quality standards for private wells may accomplish this by incorporating modified versions of two sections of the IPC into the local building code: Sub-section 602.3.3 *and* Section 202.

Establishing Testing Requirements for Private Wells

Section 602.3 (Individual Water Supply) of the IPC applies to private wells. Within that section, sub-section 602.3.3 (Water Quality) may be modified to require the submission of a report from an accredited laboratory containing water quality test results. The test results submitted by or on behalf of an applicant for a Certificate of Occupancy (CO) would then be used to determine whether the water supply meets the definition of potable water. The original IPC language follows in blue with added language *italicized* in red.

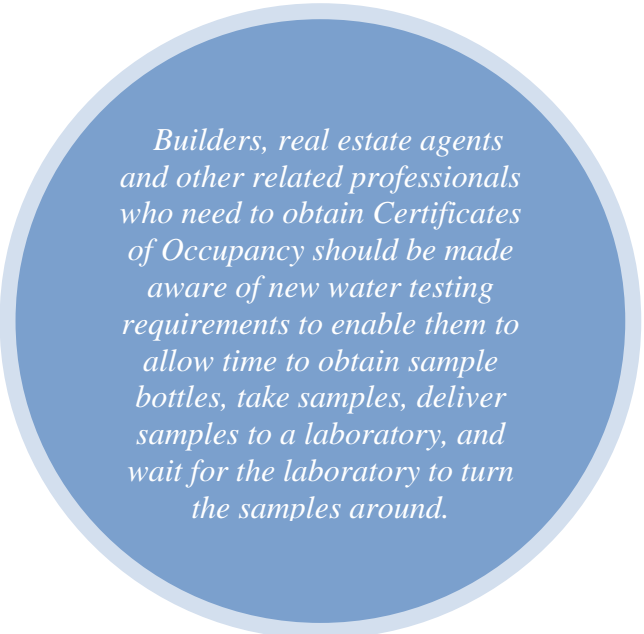
Sub-Section 602.3.3: “Water from an individual water supply shall be approved as potable by the building code enforcement authority prior to issuance of a certificate of occupancy. A report from a laboratory accredited under the N.H. Environmental Laboratory Accreditation Program or another state program under the National Environmental Laboratory Accreditation Program shall be submitted to the building code enforcement authority. When water treatment is necessary, treated water shall be tested for the contaminants listed within the “potable water” definition or as required by the municipal code enforcement authority.”



Adopting this modified version of Sub-section 602.3.3 of the International Plumbing Code (IPC) establishes a clear requirement to submit water quality test results to the municipal code enforcement authority.

Defining Potable Water Based On Well Water Testing Results

Adopting a refined definition of potable water that lists specific contaminants and the associated water quality standards will allow code enforcement or health authorities to consistently determine whether private well water meets the local definition of potable water. As noted earlier, the term “potable water” is defined in Section 202 (General Definitions) of the IPC but the definition does not refer to specific contaminants or current drinking water quality standards. The recommended refined potable water definition below establishes that some of the most common water quality standards (see Table 2) that are applied to public water systems would also be applied to private wells in a municipality. As noted above, some municipalities may wish to add other contaminants based on local groundwater water quality concerns. There are two options here: Contaminants may be added to Table 2 to require testing and compliance *town-wide*, or local officials may rely on the phrase “free from impurities present in amounts sufficient to cause disease or harmful physiological effects” to include additional parameters *on a case-by-case basis* based on information about local groundwater conditions and threats such as those listed above in the “Water Quality Testing for Private Wells” section.



Builders, real estate agents and other related professionals who need to obtain Certificates of Occupancy should be made aware of new water testing requirements to enable them to allow time to obtain sample bottles, take samples, deliver samples to a laboratory, and wait for the laboratory to turn the samples around.

The original IPC language follows in blue with added language *italicized* in red. As previously noted, parameters listed in Table 2 include only contaminants with health-based drinking water standards that apply to public water systems in New Hampshire.

Section 202 Potable Water: Water free from impurities present in amounts sufficient to cause disease or harmful physiological effects and conforming to the standards established by the New Hampshire Department of Environmental Services or U.S. EPA for the contaminants listed in [Table 2].

Implementing Requirements for Water Quality Testing and Treatment

The refined potable water definition, if adopted in a local building code, will require applicants for a (CO) to have the water tested by an accredited laboratory and submit the test results to the local building official. While a local code might *require* testing only for contaminants in its “potable water” definition, local officials might wish to adopt a *recommended* set of tests along the lines of Table 1. Attachment 3 to this document is NHDES’s list of accredited labs that currently provide testing for the contaminants listed Tables 1 and 2. (The list of laboratories is updated periodically and posted on NHDES’s

private well testing webpage.¹¹⁾ Laboratories typically group tests into packages that may or may not include all of the required or recommended contaminants; well owners should check before choosing a testing package.

Collection and delivery of water samples to a laboratory is usually the responsibility of the applicant who wishes to obtain a (CO). Laboratories typically provide both sample bottles and instructions on how to properly collect and handle water samples. Water quality test results are sent directly to the customer, who would attach the laboratory's report to the application for a (CO). Either the health officer or the building code enforcement officer would review the laboratory report to determine compliance with the water quality standards. The laboratory report will typically indicate whether the results meet state drinking water standards. If water treatment is required to remove contaminants, a second water test would be required to determine whether the treated water meets the water quality standards to be considered potable. The N.H. Department of Health and Human Services Public Health Laboratory publishes a guide entitled "Your Water Analysis" that explains what the laboratory results mean for each contaminant listed in Table 1, including their associated health or aesthetic issues and possible sources of water contamination. The publication is online at www.des.nh.gov.¹²

Test results submitted with an application for a (CO) are public information and must be made available upon request. This information may be important during subsequent real estate transfers. Although the date of the most recent water quality test must be disclosed by the seller prior to execution of a purchase and sales agreement under RSA 477:4-c (Disclosure Required; Water Supply; Sewage Disposal), the statute does not require the seller to provide water test results. However, if the test results were public information by virtue of being required for a (CO), this would make the result available to prospective buyers.

The time to collect a water sample, deliver it to a laboratory, complete water testing and receive results mailed out by the laboratory to the property owner/applicant can often range from two to four weeks. If treatment is required, expect to add an additional two to four weeks to install treatment and complete a second round of water testing. Upon adoption of a building code requiring private well water testing as a condition for a (CO), it is important to provide advance notice to the public, real estate professionals, etc. regarding the additional time that may be required to obtain the (CO).

If water treatment is necessary it should remove contaminants to levels that meet water quality standards. NHDES Factsheet *WD-DGWB-2-5, Considerations When Purchasing Water Treatment Equipment* and other, contaminant-specific fact sheets may be helpful to assist property owners considering water treatment.¹³

¹¹ Search for "NHDES private well testing."

¹² See http://des.nh.gov/organization/commissioner/lsu/documents/water_analysis.pdf.

¹³ See <http://des.nh.gov/organization/commissioner/pip/factsheets/dwgb/documents/dwgb-2-5.pdf>.

Making it Work in Your Community

For communities that wish to refine the definition of “potable water” in their building codes, developing a consensus among local stakeholders about the need to have a clear local potable water standard is an important first step. Forming a local committee, conducting public education and outreach activities, and making private well test kits available will raise community awareness about the need to have a clear standard that can be applied through a building code. Be prepared to answer questions, such as those found below in Table 2.

Table 2
Frequently Asked Questions

How many households use private wells in my municipality?	The U.S. Geological Survey (USGS) has developed estimates of the population using private wells in each N.H. community in 2005. Visit http://vt.water.usgs.gov/projects/nhvtwateruse/data/NHTownSum2005.xlsx
What are the chances of being exposed to arsenic or other contaminants in N.H. through using a private well?	The USGS estimates that one in five bedrock wells in NH has arsenic above 10 ug/L, the health-based limit for public water systems, but some parts of the state are much more likely than others to have high levels. The USGS has published maps that show the estimated probabilities of finding arsenic at 1, 5 and 10 ug/L in private wells. Visit http://pubs.usgs.gov/sir/2012/5156/ . NHDES also publishes estimates of how frequently private well water will on average exceed Standard Analysis test parameters.
What is the cost to do the tests listed in Table 2?	Prices vary by lab but the total cost of the Standard Analysis in Table 1 (which includes all of the Table 2 contaminants) usually ranges from \$85 to \$125.
Where is a nearby accredited lab that can do the water tests?	NHDES publishes a list of accredited labs. See http://des.nh.gov/organization/divisions/water/dwgb/nhelap/documents/labs-private-wells.pdf or search for “NHDES private wells testing.”
What is the proper treatment to remove contaminants from private well water?	Consult NHDES fact sheets or staff, qualified treatment professionals, and online tools to determine the proper treatment technology to remove specific contaminants. ¹⁴ Water testing is necessary to determine the proper treatment; for example, water softeners do not effectively remove arsenic. Visit http://des.nh.gov/organization/commissioner/pip/factsheets/dwgb/index.htm (see section entitled Drinking Water Quality: Contaminants)
Should the “potable water” requirement be applied to building projects that do <u>not</u> involve new wells?	Applicability of the “potable water” requirement to projects that do not involve new wells is subject to the discretion of the local building official. However, well water quality can change over time. Furthermore, increased water use and increased groundwater pumping can also cause changes in water quality.

¹⁴ NHDES provides assistance to help determine the proper water treatment technology based upon well water test results. For more information about water treatment, contact (603) 271-3108.

When Adopting a Refined Potable Water Definition -- Remember to:

- *Update any local guide(s) to municipal approval processes, as well as forms (permits, checklists) to reflect newly adopted testing and treatment requirements.*
- *Identify the local official responsible for reviewing water test results and water treatment systems.*
- *Make available at municipal offices information such as NHDES's list of accredited laboratories and NHDES's flier listing recommended tests.*
- *NHDES publishes a number of fact sheets regarding the contaminants listed in Table 1 as well as other contaminants that public water systems must test for. Current versions of these fact sheets or a list with "how to obtain" information should be made available in municipal offices.*
- *Ensure test results submitted for local permit approvals are kept on file and made available upon request.*
- *Refer applicants to NELAP accredited labs for testing and to NHDES for questions regarding water treatment.*

For more information about adopting a clear potable water standard into local building regulations, contact NHDES at (603) 271-0688.



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Attachment 1
Online Resources Related To Private Wells, Public Health,
Water Quality Testing and Treatment

HEALTH INFORMATION

Drinking Water From Private Wells and Risks to Children (American Academy of Pediatrics) <http://pediatrics.aappublications.org/content/123/6/e1123.full.pdf+html>

Dartmouth College - Toxic Metals Superfund Research Program (arsenic page) <http://www.dartmouth.edu/~toxmetal/arsenic/index.html>

WATER QUALITY TESTING AND TREATMENT

WD-DWGB-2-1 Suggested Water Quality Testing for Private Wells (NHDES) <http://des.nh.gov/organization/commissioner/pip/factsheets/dwgb/documents/dwgb-2-1.pdf>

WD-DWGB 3-2 Arsenic in New Hampshire Well Water (NHDES) <http://des.nh.gov/organization/commissioner/pip/factsheets/dwgb/documents/dwgb-3-2.pdf>

Water Quality Testing for Private Wells in New Hampshire (NHDES) http://des.nh.gov/organization/divisions/water/dwgb/well_testing/documents/well_testing.pdf

NH DHHS Public Health Laboratories Analysis Guide for Homeowners (DHHS) http://des.nh.gov/organization/commissioner/lsu/documents/water_testing.pdf

DHHS Public Laboratories Online Order Form for Test Containers for Homeowners (DHHS) <http://www2.des.state.nh.us/DESONestop/HOBottles.aspx>

WD-DGWB-2-5 Considerations When Purchasing Water Treatment Equipment (NHDES) <http://des.nh.gov/organization/commissioner/pip/factsheets/dwgb/documents/dwgb-2-5.pdf>

Attachment 2

NHDES Private Well Testing Flier

Protect Your Family's Health

Test Your Water Today for All Common Pollutants



Why should I test my well water?

Unhealthy levels of various contaminants are common in private wells in New Hampshire. Some of these contaminants have been linked to cancer and other diseases. Most of these contaminants have no taste, smell or color. You won't know what's in your well water unless you have it tested by a laboratory. State and local laws generally do not require testing of private well water. If you have a private well, the New Hampshire Department of Environmental Services (NHDES) strongly recommends that you have your well water tested – for all of the most common pollutants – to help protect your family's health. If a test shows that your well water has contaminants in it, NHDES can help you consider water treatment choices that work best for the level of contaminants in your water.

How do pollutants get into well water?

Well water comes from rain and snow that soaks into the ground. As water seeps through the soil and rock, it can pick up pollutants and other materials that are present on or in the ground.

Some contaminants that are commonly found in well water at unsafe levels come from the rocks and soil that the water flows through. The most common in New Hampshire are bacteria, radon, arsenic, manganese, uranium and radium. For example, the U.S. Geological Survey estimates that one in five private wells in New Hampshire has more arsenic than is allowed in public water systems.

Other contaminants get into well water from human activities. Gasoline storage and spills, industrial/commercial activities, improper waste disposal and road salting can introduce toxic substances to the ground. Even typical residential activities, such as using fertilizers or pesticides too close to a well, spilling fuel and improperly disposing of household chemicals can contaminate well water.

What should I test my well water for?

The following tests identify common contaminants found in well water in New Hampshire. Many private wells have been tested according to the requirements of mortgage companies or at the recommendation of well drillers, water treatment vendors, etc., but often those tests do not include all of the common contaminants that can harm your health, especially if they were done years ago. The list recommended in this flier provides a cost-effective, reasonable overview of a well's water quality. Contact an accredited laboratory for availability and pricing. *It is not necessary to do all of these tests at one time.*

💧 Standard Analysis

This covers the most common contaminants (see the list on the next page). Some of these contaminants pose health-related concerns, while others only affect aesthetics (taste and odor).

💧 Radiological Analysis

The rocks in New Hampshire contain naturally occurring radioactive elements that dissolve easily in well water. The recommended radiological analysis will test for uranium, analytical gross alpha and radon.

Testing for radon in air may have been required by your mortgage company; however, radon and other radioactive elements are also common in well water in New Hampshire. NHDES estimates that approximately 55 percent of private wells in New Hampshire exceed NHDES' recommended action level for radon.

💧 Volatile Organic Compounds (VOCs)

The most common VOCs come from compounds found in gasoline, such as MtBE and benzene, and from industrial solvents. MtBE can be found in well water even in remote areas.

💧 Additional Tests

Circumstances specific to your well or property may require additional testing not described here. For instance, NHDES does not recommend routine testing for pesticides, herbicides or other synthetic organic compounds (SOCs), mainly because of the high cost. However, such testing might be a good idea if your water has elevated nitrite or nitrate concentrations and an agricultural source is suspected, or significant amounts of pesticide have been applied near your well.

These less-routine tests may not be performed at all laboratories.

What will testing tell me?

The laboratory report you receive will show the level at which any of the tested substances were found in your water sample. The mere presence of a contaminant in your well water does not necessarily mean that there is a problem. However, when levels exceed state or federal health standards or recommended action levels, there may be a problem and you should take steps to fix it. Several methods are available from water treatment vendors to remove contaminants from water. NHDES has fact sheets on its website covering all common water quality problems and their solutions.

When should I test my well water?

NHDES recommends that prospective homebuyers test the water in a home with a private well before purchase.

Water quality in wells is generally stable, and if a change is going to occur, it occurs slowly. Thus the time between water quality tests, once you've purchased the home, can generally be several years if a well is properly constructed and located in a safe area. Bacteria and nitrate are exceptions; you should test for them every year.

The following conditions would call for more frequent testing:

- Heavily developed areas with land uses that handle hazardous chemicals.
- Recent well construction activities or repairs. NHDES recommends testing for bacteria after any well repair or pump or plumbing modification, but only after substantial flushing of the pipes.
- Elevated contaminant concentrations found in earlier testing.
- Noticeable variations in quality such as a change in taste, smell, or appearance after a heavy rain or an unexplained change in a previously trouble-free well, such as a strange taste or cloudy appearance.

When taking any sample, NHDES recommends that it be taken after a heavy rainstorm. These events tend to highlight conditions of improper well construction or poor soil filtration.

NHDES recommends having the following tests done every 3 to 5 years, except for bacteria and nitrate, which are recommended annually.

Standard Analysis

Arsenic	Lead
Bacteria	Manganese
Chloride	Nitrate/Nitrite
Copper	pH
Fluoride	Sodium
Hardness	Uranium*
Iron	

Radiological Analysis

Analytical Gross Alpha
Radon
Uranium*

Volatile Organic Compounds (VOCs)

***Please note: Uranium is part of both the standard and radiological analysis for the State of NH Lab.**

Learn More

For information about private well testing, or about accredited laboratories in New Hampshire, visit the NHDES website: www.des.nh.gov

Go to the A to Z List and select "Private Well Testing"



Attachment 3

List of Accredited Laboratories That Perform NHDES-Recommended Water Quality Tests Referred to as the “Standard Analysis”

Table 1
Accredited Labs Providing Well Water Quality Testing Services
in New Hampshire and Neighboring States^{1, 2}

LABORATORY NAME	TELEPHONE	ADDRESS	TOWN	STATE	WEBSITE
ABSOLUTE RESOURCE ASSOCIATES LLC	(603) 436-2001	124 HERITAGE AVE	PORTSMOUTH	NH	WWW.ABSOLUTERESOURCEASSOCIATES.COM
AQUARIAN ANALYTICAL INC	(603) 783-9097	153 WEST RD	CANTERBURY	NH	WWW.AQUARIANLABS.COM
CHEMSERVE INC	(603) 673-5440	317 ELM ST	MILFORD	NH	WWW.CHEMSERVELAB.COM
EAI ANALYTICAL LABS	(603) 357-2577	149 EMERALD STREET	KEENE	NH	WWW.EAI-LABS.COM
EASTERN ANALYTICAL INC	(603) 228-0525	25 CHENELL DR	CONCORD	NH	WWW.EAILABS.COM
ENDYNE INC	(603) 678-4891	56 ETNA ROAD	LEBANON	NH	WWW.ENDYNELABS.COM
EPPING WELL & PUMP COMPANY	(603) 679-5299	337 CALEF HWY	EPPING	NH	WWW.EPPINGWELL.COM
GRANITE STATE ANALYTICAL SERVICES LLC	(603) 432-3044	22 MANCHESTER RD, UNIT 2	DERRY	NH	WWW.GRANITESTATEANALYTICAL.COM
NELSON ANALYTICAL LLC	(603) 622-0200	490 E INDUSTRIAL PARK DRIVE	MANCHESTER	NH	WWW.NELSONANALYTICAL.COM
NEW ENGLAND RADON LTD	(603) 893-4260	11 A INDUSTRIAL WAY UNIT 3	SALEM	NH	WWW.NEWENGLANDRADON.COM
NH DHHS PUBLIC HEALTH LABORATORIES	(603) 271-3445	29 HAZEN DR	CONCORD	NH	des.nh.gov/organization/commissioner/lisu/index.htm
SEACOAST ANALYTICAL SERVICES	(603) 868-1457	72 PINKHAM RD	LEE	NH	
KATAHDIN ANALYTICAL SERVICES INC (#2001)	(207) 874-2400	600 TECHNOLOGY WAY	SCARBOROUGH	ME	WWW.KATAHDINLAB.COM
NELSON ANALYTICAL LLC	(207) 467-3478	120 YORK STREET	KENNEBUNK	ME	WWW.NELSONANALYTICAL.COM
ACCUTEST LABORATORIES OF NEW ENGLAND INC	(508) 481-6200	495 TECHNOLOGY CTR WEST	MARLBOROUGH	MA	WWW.ACCUTEST.COM
CON-TEST ANALYTICAL LABORATORY	(413) 525-2332	39 SPRUCE ST	E LONGMEADOW	MA	WWW.CONTESTLABS.COM
ALS ENVIRONMENTAL (#2941)	(585) 288-5380	1565 JEFFERSON ROAD	ROCHESTER	NY	WWW.ALSGLOBAL.COM
PACE ANALYTICAL SERVICES INC	(631) 694-3040	575 BROAD HOLLOW ROAD	MELVILLE	NY	WWW.PACELABS.COM

Water Quality Testing for Private (Domestic) Wells: DES recommends residents test their well water for all contaminants commonly found in New Hampshire's groundwater, listed in Table 2 below. Private well owners are encouraged to test their water wells every three to five years for the complete set of contaminants listed below. Contact an accredited laboratory to confirm the lab's capacity to complete all recommended tests and for pricing. It is not necessary to do all of these tests at one time.

¹ Updated 6.23.14. Subject to change. For up-to-date information, see <http://www2.des.nh.gov/CertifiedLabs/Certified-Method.aspx>.

² Some labs may not accept samples provided by the general public. Please call labs directly for details.

For more information about DES recommended private well water quality testing, see DES's Fact Sheet WD-DWGB-2-1 Suggested Water Quality Testing for Private Wells (2011) online at <http://des.nh.gov/organization/commissioner/pip/factsheets/dwgb/documents/dwgb-2-1.pdf>.

Table 2 NH DES Recommendations for Private Well Testing	
Standard Analysis	Testing Frequency
Arsenic Bacteria Chloride Copper Fluoride Hardness Iron Lead Manganese Nitrate/Nitrite pH Sodium Uranium	Every 3 to 5 years (except for bacteria and nitrate, which are recommended yearly)
Radiological Analysis	
Radon Uranium Analytical Gross Alpha	Every 3 to 5 years
Volatile Organic Compounds (VOCs)³	
VOCs	Every 3 to 5 years

For more information or technical assistance related to private well testing visit NH DES's website, www.des.nh.gov, go to the A to Z List and find Private Well Testing and visit the Private Well Testing Program webpage.

³ The most common VOCs come from gasoline compounds, such as MtBE and benzene, and industrial solvents.